

CLAIMS

1. A computer program analysis method comprising the steps:

analyzing a computer program to generate an initial error report and a list of suspected error conditions; and

generating a set of assertions and inserting the assertions into the computer program to determine if the suspected error conditions are valid.

2. A method according to Claim 1, wherein the step of inserting the assertions into the computer program includes the step of using the assertions to check the conditions for the suspected errors during program execution and to report the errors if the conditions are valid.

3. A method according to Claim 1, further comprising the steps of:

testing the computer program for any user supplied test cases; and

if there are user supplied test cases, determining if the test cases lead the program execution to satisfy the suspected error conditions.

4. A method according to Claim 3, wherein the step of inserting the assertions into the computer program includes the step of, if the test cases lead the program execution to satisfy the suspected error conditions, then using the assertions to determine if the suspected error occurs.

5. A method according to Claim 1, wherein the generating step includes the steps of:

generating an assertion for each of the errors and suspected errors; and

inserting into the computer program assertions for all of said errors and suspected errors.

6. A method according to Claim 1, wherein the step of analyzing the computer program includes the step of attempting to resolve the Boolean conditions that determine the program's control flow and execution.
7. A method according to Claim 6, wherein the step of attempting to resolve the Boolean conditions includes the step of using a strong static analysis to analyze the computer program.
8. A method according to Claim 1, wherein the step of analyzing the computer program includes the step of using a program verifier to analyze the computer program.
9. A system for analyzing a computer program comprising:
- an analyzer means for analyzing a computer program to generate an initial error report and a list of suspected error conditions; and
- an assertion generator for generating a set of assertions and inserting the assertions into the computer program to determine if the suspected error conditions are valid.
10. A system according to Claim 9, wherein the assertion generator uses the assertions to check the conditions for the suspected errors during program execution and to report the errors if the conditions are valid.
11. A system according to Claim 9, further comprising:
- a tester for testing the computer program for any user supplied test cases; and if there are user supplied test cases, for determining if the test cases lead the program execution to satisfy the suspected error conditions.
12. A system according to Claim 11, wherein, if the test cases lead the program execution to satisfy the suspected error conditions, then the assertion generator uses the assertions to determine if the suspected error occurs.

13. A system according to Claim 9, wherein the assertion generator generates an assertion for each of the errors and suspected errors, and inserts into the computer program assertions for all of said errors and suspected errors.

14. A system according to Claim 9, wherein the analyzer means analyzes the computer program by attempting to resolve the Boolean conditions that determine the program's control flow and execution.

15. A system according to Claim 14, wherein the analyzer means uses a strong static analysis to analyze the computer program.

16. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for analyzing a computer program, said method steps comprising:

analyzing a computer program to generate an initial error report and a list of suspected error conditions; and

generating a set of assertions and inserting the assertions into the computer program to determine if the suspected error conditions are valid.

17. A program storage device according to Claim 16, wherein the step of inserting the assertions into the computer program includes the step of using the assertions to check the conditions for the suspected errors during program execution and to report the errors if the conditions are valid.

18. A program storage device according to Claim 16, wherein said method steps further comprise the steps of:

testing the computer program for any user supplied test cases; and

If there are user supplied test cases, determining if the test cases lead the program execution to satisfy the suspected error conditions; and wherein

the step of inserting the assertions into the computer program includes the step of, if the test cases lead the program execution to satisfy the suspected error conditions, then using the assertions to determine if the suspected error occurs.

19. A program storage device according to Claim 16, wherein the generating step includes the steps of:

generating an assertion for each of the errors and suspected errors; and

Inserting into the compute program assertions for all of said errors and suspected errors.

20. A program storage device according to Claim 16, wherein the step of analyzing the computer program includes the step of using a strong static analysis to attempt to resolve the Boolean conditions that determine the program's control flow and execution.

21. A program storage device according to Claim 16, wherein the step of analyzing the computer program includes the step of using a program verifier to analyze the computer program.